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IN THIS ISSUE

Complete Table of Contents Appears on Page 59)

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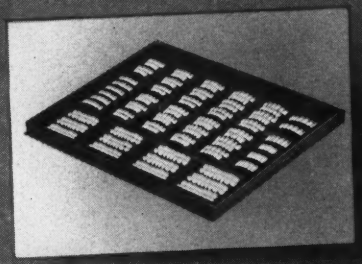

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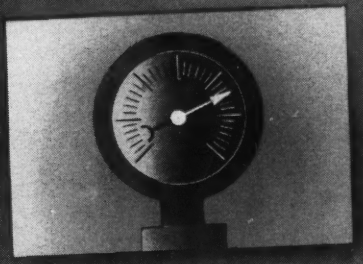

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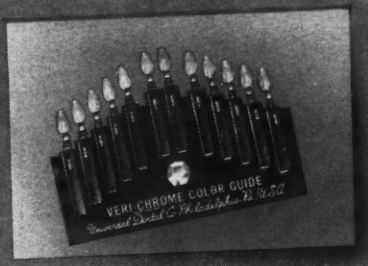

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Vol. 55, No. 2

Dental Digest

FEBRUARY 1949

About Our CONTRIBUTORS

WILLIAM E. WILSON, D.D.S. (St. Louis University, School of Dentistry, 1919) has for twenty years been engaged in research in plastics. Since 1939 Doctor Wilson has published four articles in DIGEST on the various uses of acrylic in dentistry. In his present article, AN INDIRECT BRIDGE IMPRESSION TECHNIQUE, he describes the method found to be most satisfactory in using the elastic products.

HORTON D. KIMBALL, D.D.S., (University of Michigan, 1930); D.D.Sc., (University of Michigan, 1935) is a member of the American Academy of Dental Medicine, the Committee to Investigate Elastic Impression Materials, and the International Association for Dental Research. In his present article, HYDROCOLLOID IN RESTORATIVE DENTISTRY—TECHNIQUE AND PRINCIPLES, Doctor Kimball describes the procedure for the use of plastic impression material applied to fixed restorations that in his experience has been found to be most nearly "foolproof" and the simplest to use.

LOUIS B. KELSTEN, D.D.S., (University of Maryland Dental School, 1937) is engaged in the practice of general dentistry with emphasis on pedodontics. His article, RESTORING PRIMARY MOLARS WITH RAMPANT CARIES, in the current DIGEST describes in detail the method he has evolved for restoring a vital primary molar with a gold inlay.

EDWARD J. RYAN, B.S., D.D.S., Editor
708 Church Street, Evanston, Illinois

An Indirect
BRIDGE IMPRESSION *Technique*

W. E. WILSON, D.D.S., Springfield, Illinois

DIGEST

The introduction of new alginate impression materials has required a vast amount of experimentation in order to arrive at the most satisfactory method of using the elastic products to the best advantage. Because of a difference in dimensional changes of the alginate and the new special rapid setting die stone, modifications of the technique of taking indirect bridge impressions have been necessary. A simple method involving the use of an alginate cream material is described herein.

THE MANY new elastic impression materials are presented to the dental profession under various trade names and research technicians have tested the versatility and reliability of the new products extensively. The materials may be classified into three general groups:

1. The water alginate.
2. The cream alginate.
3. The hydrocolloid.

A Changed Technique

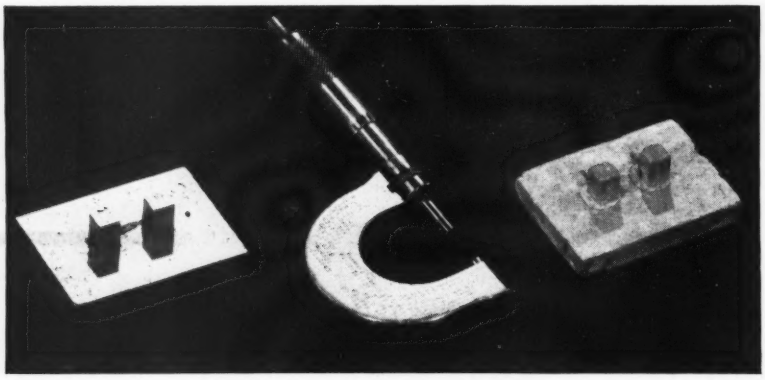
With the introduction of the new impression products, experiments have been made with a number of indirect bridge techniques. It was found necessary to develop a way of checking the dimensional changes of the impression material and of the die stone used in pouring up the model. A simple method for accomplishing this is as follows:

1. Make a steel die with two pillars, each ¼ inch square and ½ inch high with an overall measurement of 1 inch (Fig. 1, left).

2. The walls of the pillars must be milled parallel.

3. Make an impression of this die and pour up with the selected die stone.

4. Compare the overall measurement of the steel die with the micrometer reading of the die stone model (Fig. 1, right).



1. *Steel die and die stone model.*

Rapid Setting Stone

The expansion in the new special rapid setting stone that has been developed is not more than 0.02 per inch. The initial setting of this die stone is from 8 to 10 minutes; the final setting time not more than 15 minutes.[1] Although any of the three types of impression materials can be used, after wide experimentation the cream type gave the most satisfactory results in working time and accuracy.

The accuracy of a finished bridge can be determined by constructing a steel model of an upper six-tooth anterior bridge with the grooves and slots that are used in everyday practice (Fig. 2). It has been found that a steel bridge die of this type will not be susceptible to thermal changes during the process of taking the impression and constructing the finished bridge to fit.

Method of Using Material

The alginate used is presented with a powder alginate and a tube of the cream. Use four inches of cream to one teaspoon of powder. To make larger amounts, double or triple the basic proportions.

1. Place the cream in a mixing bowl and pour the powder over it. Spatulate immediately against the side of the bowl. Whip into a creamy homogenous mixture for about 1½ minutes.

2.Thoroughly clean the abutments after they are completed. If the cavity

[1]Skinner, E. W., and Pomés. Carlos E.: Alginate Impression Materials, Technique for Manipulation and Criteria for Selection, J.A.D.A. 35:245-256 (August) 1947.

2. ***Placing soft, cream type alginate mix. Remainder of mix combined with cotton, is in tray.***

3. ***Placing tray over die.***

preparation extends under the gingiva, pack the soft tissue by the method of choice.

3. Place a cotton roll in the mouth and clean and dry all tooth surfaces. With a stiff lipstick brush apply a small amount of the creamy mix in the cavity. Take care not to trap air bubbles in the cavity preparations. Place the cream mix over the remaining part of the tooth (Fig. 2).

4. The common fault of the alginate and hydrocolloid is that they lack proper body for finishing the impression. After extensive study of various methods it was found that fluffy cotton can be mixed with the remaining alginate and placed in the bottom of the impression tray.

5. Place a small amount of the thin cream over the cotton mix. Insert the tray into the mouth and hold it steady. The setting time is approximately three minutes. Do not remove until the set is assured (Fig. 3).

6. Remove the impression from the mouth with a sudden jerk.

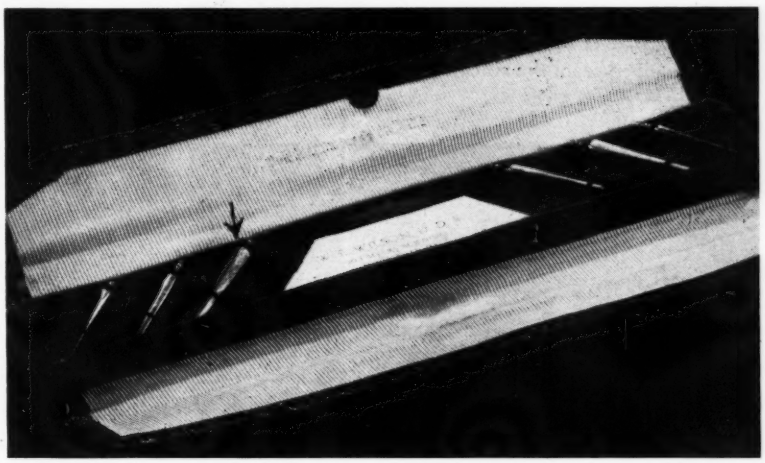
Design of Pins—Pins should be made from brass rods from 1/8 to 3/8 inches in circumference (Fig. 4), and from 1 to 1½ inches long, coned down from the head. The coned pin has a flat V-shaped groove about ½ of its circumference to form a definite lock (Fig. 4, arrow). This insures a seat and avoids rotation when removing and placing back into the model. The head of the pin should be small to insure the bulk of die stone in the tooth.

Pouring up the model—1. Mix a small amount of die stone. The mix should be of the consistency of putty to increase strength. Place a small amount of the stiff mixture into the impression of the abutments and vibrate to prevent trapping bubbles.

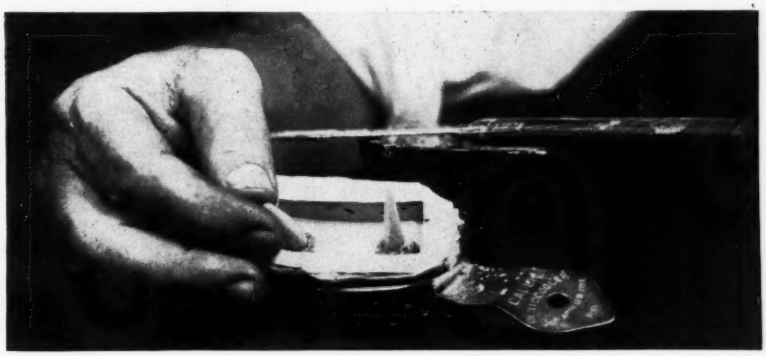
2. Insert a pin in the die stone and cone so that there are no undercuts (Fig. 5).

3. The rapid setting die stone will set in about five minutes (Fig. 6). Place a separator over the smooth die stone and lubricate the pin with vasoline.

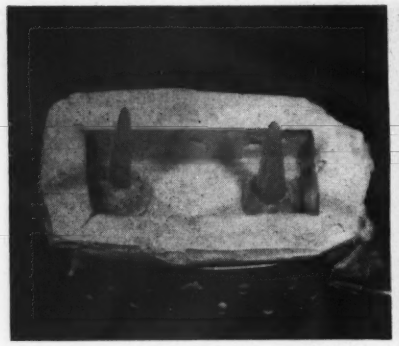
4. Now make the second mix of



4. ***Pins made of brass or plastic.***

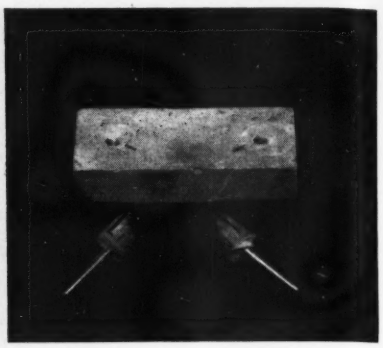


5. ***Pour-up of teeth and placement of pins.***



6. *Die stone pour of abutments with pins.*

7. *Model of die stone.*

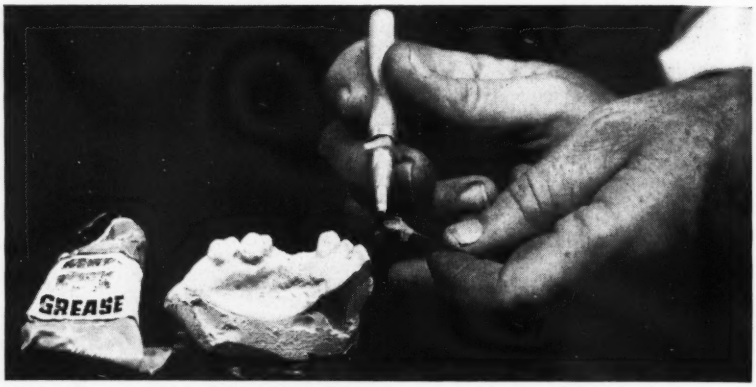


8. *Die stone model with die stone pin teeth removed.*

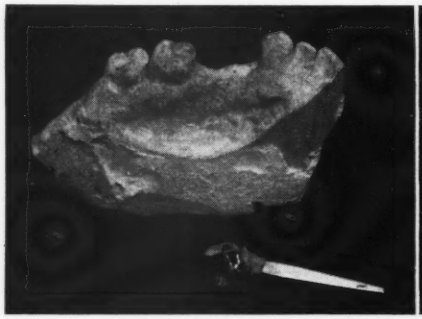
Tru-stone in proportion of 100 parts powder to 30 parts water and pour into the remaining impression. Take care not to over-vibrate and jar the pins out of the abutment impressions while making the second pour-up (Fig. 7).

5. After setting about one-half hour the die stone may be separated from the impression and checked so that the pins can slide in and out of the die (Fig. 8).

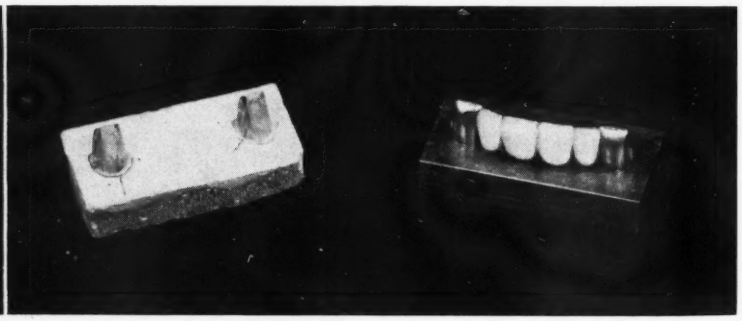
Waxing up—A new lubricant has been developed from the silicon plas-



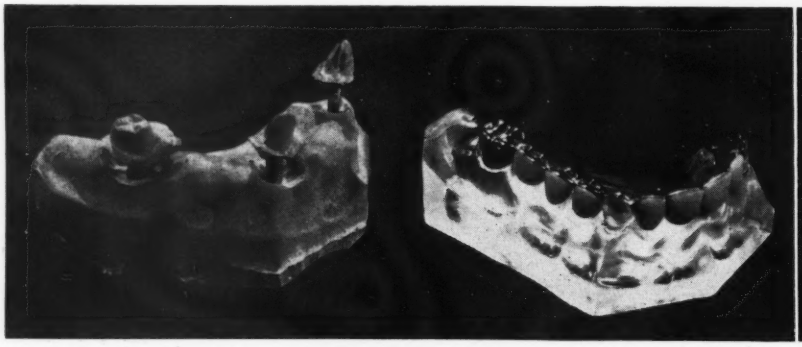
9. *Placing silicon grease on tooth before waxing.*



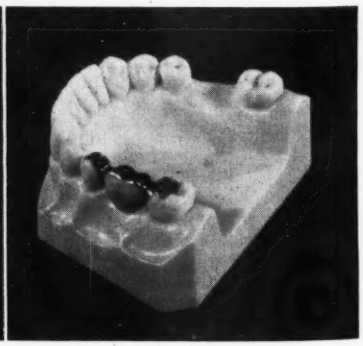
10. *Inlay wax-up before testing in mouth.*



11. *Finished bridge on steel die.*



12. *Ten tooth bridge and die stone model with pins.*



13. *Lower first molar replacement and die stone model.*

tic (Dowcorning Corporation). It was found after trial that when this material is placed on the model the die stone absorbs it, producing a slick surface. The silicon grease has a higher melting point than the hydrocarbon inlay waxes. When polished into it by cotton held in a pair of pliers this product gives the die stone a dentine-like surface. The hydrocarbon inlay wax is not soluble in the silicon, so that a hot spatula can be used without fear of its sticking to the surface of the die stone (Fig. 9).

After the pattern is waxed, test it in the mouth for correction (Fig. 10). A casting should be made and placed in the mouth to check and burnish. Take a bite and assemble on an articulator so that each pin can be removed easily. Place the casting on the model and complete the bridge by any method that has proved successful (Fig. 11).

504 *Myers Building*

Change In Pain Threshold After Analgesic Drugs

DRUG	DOSE	MAXIMUM RISE PAIN THRESHOLD	DURATION TO ACTION
Morphine	30 mgm.	100%	6 hrs.
Heroin	1.5 mgm.	110%	2 to 3 hrs.
Dilaudid	2 mgm.	110%	3 to 4 hrs.
Amidone (Methadon)	2.5 mgm.	100%	3 to 4 hrs.
Metapon	5 mgm.	100%	3 to 4 hrs.
Demerol	100 mgm.	50%	2 to 3 hrs.
Codeine	60 mgm.	48%	2 to 3 hrs.
Ethyl Alcohol	30 cc.	40%	1 to 2 hrs.
Aspirin	2.0 Gm.	35%	2 hrs.
Aspirin and Caffeine	2.0 Gm.	38%	2 hrs.
Acetanilid	0.5 Gm.	30%	2 hrs.
Acetophenetidin	0.5 Gm.	35%	2 hrs.
Paraldehyde	10 cc.	20%	2 to 3 hrs.
Barbiturates		0%	
Quinine	0.5 Gm.	0%	
Caffeine	120 mgm.	0%	
Ergotamine	0.5 mgm.	0%	

Reprinted from Mod. Hosp. (October) 1947.

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HYDROCOLLOID *in Restorative Operative Dentistry - Technique and Principles**

HORTON D. KIMBALL, D.D.S., D.D.Sc., Detroit

DIGEST

Hydrocolloid is familiar to all who have used it as an impression material for partial dentures and removable bridge construction. When applied to fixed restorations its potentialities are unlimited. Its use in this respect was first described by A. W. Sears[1] in 1937. Numerous variations of the original technique have been developed, and most of them have been tried by the author. Of all the variations, the simplest and most nearly "fool proof" is presented herein. A discussion of some of the other techniques is also included in order to broaden the reader's knowledge of the entire subject.

*Read before Pennsylvania State Meeting, Atlantic City, May, 1948.

[1]Sears, A. W.: Hydrocolloid Technique for Inlays and Fixed Bridges, Dental Digest **43**:230-234 (May) 1937.

Advantages of Hydrocolloid in Restorative Dentistry

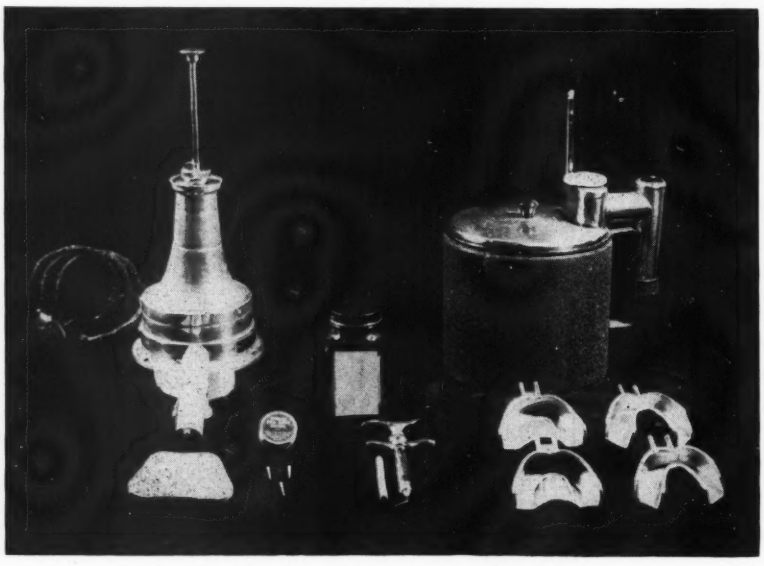
HYDROCOLLOID IS most commonly used as an impression material for partial dentures and removable bridge construction. Its potentialities as applied to fixed restorations are infinite. Among the advantages in the use of hydrocolloid for this type of work are the following:

Accuracy—The finished restoration fits as well as one constructed in the conventional manner.

Speed—Fixed bridges constructed by the technique described here may be done with a saving of 40 per cent to 50 per cent chair time. Only two visits, instead of the customary three, are required to complete the bridge.

Simplicity—Once its fundamental precepts are mastered, the technique is essentially a simple one.

Versatility—The material can be applied to numerous situations, e.g., inlays, jacket crowns, fixed bridge construction, and partial denture construction where abutment teeth require restorative dentistry.



1. ***Essential Materials Required to Employ Hydrocolloid Technique.***

Armamentarium Required

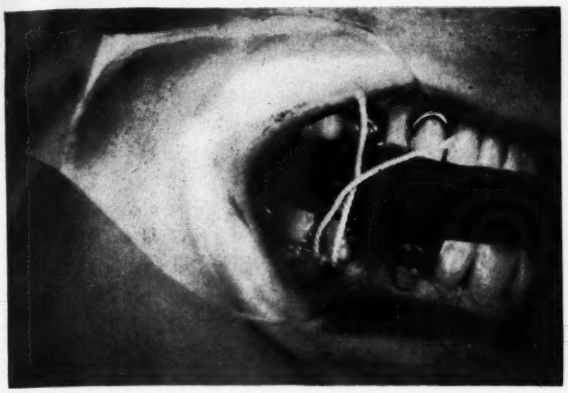
Many of these materials are to be found in the average dentist's office. Other articles of essential equipment required are the following (Fig. 1):

1. A syringe for injecting the hydrocolloid into the cavity preparations.
2. Prepared hydrocolloid cartridges to fit them.
3. Needles of various gauges.
4. A special heater with softening and tempering baths thermostatically controlled.
5. Tapered brass dowel pins and a roll of stainless steel matrix metal about .003 of an inch thick and ¼ inch wide are also required.
6. A die stone, any one of several makes available. (A die material, ceramic in nature and hard enough to scratch glass is expected to be available before long).

Procedure

Controlling the Gingival Tissue—This has been one of the major problems in the application of hydrocolloid to inlay and crown construction.

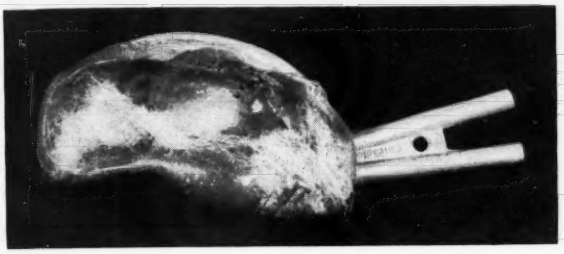
First Method and Method of Choice—After the cavity preparation is made a length of twine about 1 mm. in diameter is tied about the tooth with the knot placed so it will not interfere with the cavity preparation itself. Ordinary children's kite string is ideal for this purpose. The ends of the twine are cut close to the knot. It is saturated with an 8 per cent solution of zinc chloride and with an instrument is forced firmly just beneath the gingival margin. This packs away the gingival tissues so that a clear-cut impression of the cervical part of the cavity may be obtained. Leave it in place while the impression is being taken, and then remove (Fig. 2).



2. ***Use of Heavy String to Retract and Pack Away Cervical Tissues.***

3. ***Tray Prepared and Ready to Take Hydrocolloid Impression.***

4. ***Completed Hydrocolloid Impression.***



The objection to this method is that it cannot be used successfully with a full crown preparation because the knot interferes. In this case the ends of the string should not be tied but merely overlapped and both should be forced beneath the gingival margin.

Second Method—Twist a small "rope" of cotton. This also should be saturated with an 8 per cent zinc chloride solution and packed firmly beneath the gingival margin to expose the cervical margins of the preparations. Leave the cotton "rope" in place about five minutes. It should usually be removed just prior to the injection of the hydrocolloid.

The zinc chloride solution acts as an astringent and serves to shrink the gingival tissues somewhat in addition to the mechanical packing of the cotton "rope."

Third Method—A stronger concentration of zinc chloride can be used. Twine can be dipped into 100 per cent zinc chloride but as zinc chloride is extremely caustic in such a concentration to attempt the use of this procedure is not advised until the operator has gained experience.

Fourth Method—Access to the cervical of the cavity preparations can be gained by the use of the cold cautery method. A fine wire tip is used and a minute V-shaped section of the gingival tissue is removed. In the hands of an experienced operator excellent results have been obtained by this method. Extreme care must be taken, however, as the removal of too much tissue, or the application of too much current may produce a sequestration of alveolar process with resultant exposure of part of the root.

Fifth Method—Another satisfactory way of disposing of the cervical tissues is to place a small rubber band (such as those used by orthodontists) about each tooth in which a preparation has been made. With an instrument pack these beneath the gingival margin and *leave in place only while the impression is being taken.* They are then removed. No injury results to the periodontal membrane.

Taking the Impression

1. A stick of hydrocolloid should have been softened previously and placed in a tempering bath which may vary from 120° to 150° F, depending on the make of hydrocolloid used.

2. Fill the syringe with a cartridge and place in boiling water to soften. Do not boil the hydrocolloid too long as prolonged boiling tends to weaken it. The manufacturer's directions for heating and tempering should be closely followed. Two or three minutes boiling for the injection syringe is usually sufficient.

3. It is then placed in a tempering bath of about 150°. This keeps the material at the proper consistency until needed.

4. Now select a suitable impression tray, partly filled with impression compound and take a "matrix" impression of the general area. It is better to have the impression cover too much area than not enough.

5. Scrape the compound away from the edentulous and the bridge tooth abutment area, insuring an ample thickness of hydrocolloid later in those regions. All undercuts of compound should also be removed. Leave enough compound in the occlusal region of the other teeth to act as a "stop" so that when the tray is filled with hydrocolloid and carried to place it will be guided by the compound "matrix" and "stops."

6. Next, flame the surface of the compound until sticky and daub a few cotton fibers on it. These cause the hydrocolloid to adhere, and not pull away from the compound when the impression is removed from the mouth (Fig. 3).

7. When ready for use the hydro-

colloid in the injection syringe should be of a consistency similar to pancake batter and should flow and flatten out when extruded from the needle.

8. Remove the injection syringe from the tempering bath and start the injection of the hydrocolloid into cavity preparation. Start injection at interproximal to avoid trapping air bubbles, and continue the injection until the tooth is entirely covered and a considerable mass is built up about it. Each abutment tooth is injected in a similar fashion. One cartridge is usually sufficient to inject three cavities. If more are to be injected, have another syringe prepared and ready.

9. While the hydrocolloid is being injected about the teeth, the impression tray should be filled so that the instant the injection syringe is set aside the impression tray can be inserted. The tray should be seated thoroughly, using the compound "stops" as a guide. Cold water should be allowed to circulate through it for at least five or six minutes. A prolonged chilling insures a complete gel of the hydrocolloid deep within the cavity preparations. In extremely hot weather it is helpful to place a container of ice water on the operating table. One end of the rubber tubing is placed in the ice water and the outlet end is connected into the saliva ejector.

Important Factors—P. B. Taylor[2] points out that bulk of material and pressure used in taking an impression with hydrocolloid are important factors in accuracy of reproduction. Thus, as the material gels the dentist is apt to increase pressure on the impression tray, causing the material to harden under stress. When the pressure is released, the stresses are also released. Inasmuch as the material possesses a high degree of flexibility, the resulting strains will be considerable; and the area of the impression will tend to become less, but the volume of the impression material will increase as the stresses and strains are released. Obviously, a distorted cast will result.

Removing the Impressions—Remove the impression with a straight sharp pull to avoid tearing (Fig. 4).

To Obtain Accuracy—As the hydrocolloidal materials are sensitive to changes in humidity, accuracy of mouth reproduction can be obtained only by pouring the model immediately after taking the impression.

Dimensional Changes

Skinner and Kerr[3] state that when allowed to remain in an atmosphere of less than 100 per cent humidity, hydrocolloid will contract. When placed under water, if it is not already saturated at the temperature involved, it will imbibe water and expand. The amount of water, therefore, necessary for a condition of equilibrium is dependent on the temperature.

Dimensional changes do not occur when the material is changed from the mouth (chilling temperature) to room temperature. The imbibition counteracts the thermal contraction.

Safe Procedure—By immersing the impression in water for a period of 4 to 6 hours, an expansion in the hydrocolloid slightly over .1 per cent is generally induced. The expansion of the die stone in setting is approximately the same amount. The reduction in size of the impression of the prepared cavity because of hydrocolloidal expansion is largely compensated by the fact that the die stones have a setting expansion of about .125 per cent.

Rinse the Impression Before Pouring—Paffenbarger[4] has shown that before pouring the dies and model it is important to remove saliva and the liquid which exudes from the impression. This liquid reacts with the die stone and the model stone and produces a rough, soft, chalky surface on the die and model.

Special Properties—Because of certain properties possessed by hydrocolloid material special handling is called for: 1. The model of the base should be at least 10 mm. thick to avoid the posibility of warpage.

2. The model should be separated as soon as possible after it has hardened because the exudate may dissolve the water soluble salts in the gypsum of the model or die stone and produce a roughened or etched surface.

The completed impression (Fig. 4) after syringing to remove blood or saliva, is placed in water until the die and model are to be prepared. The bite is taken, the color matched, temporary fillings are inserted, and the patient dismissed.

Preparing the Dies and Model

Of many methods those most satisfactory are the following:

First Method—Vibrate die stone into each cavity preparation. After the dies have hardened, remove them carefully from the impression and vibrate more die stone into the preparations. While the die stone is still soft, vibrate model stone into the remainder of the impression. This method provides separate dies on which to fabricate wax patterns, check the contact points, and construct the pontics on the models with fixed dies.

Second Method—Follow the above procedure with the exception that after removing the dies the entire model, dies and all, is poured with bridge investment. On the resultant model the bridge is assembled and soldered.

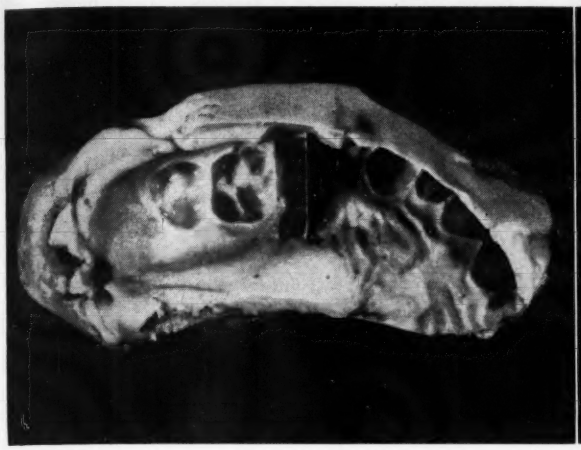
Variations of These Methods—1. After removing the dies, trim and grind the "root" portion of the die to a taper. Then drill a small hole into the apex of the "root" and cement one of the brass tapered dowel pins to place. The die and dowel pin should then be coated lightly with petroleum jelly and carefully reinserted into the impression which is next boxed and poured. In this fashion a model with removable dies is produced.

2. After a short tapered root stump is built up by vibrating die stone into the preparations, the head of a brass dowel pin is gently pressed into the soft die stone and an instrument is used to shape the root portion of the die with a taper so it may be extruded from the completed model. When set, the exposed portion of the die and dowel pin are lightly coated

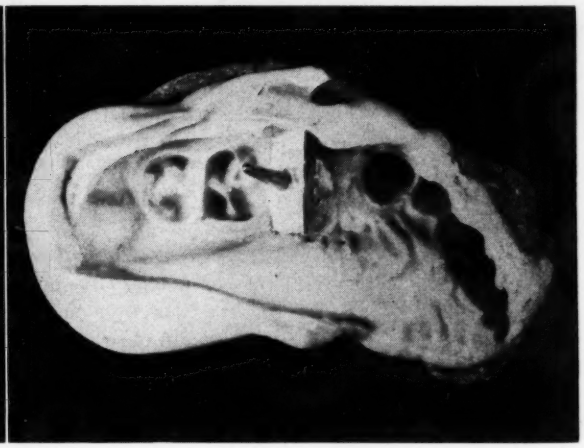
[2]Skinner, E. W.: Science of Dental Materials, ed. 3, Philadelphia, W. B. Saunders Company, 1946, p. 61.

[3]Skinner, E. W., and Kerr, W. R.: Colloidal Impression Materials, J.A.D.A. **25**:578 (April) 1938.

[4]Paffenbarger, G. C.: Hydrocolloidal Impression Materials, J.A.D.A. **27**:373 (March) 1940.



5. *Matrix Metal Separators in Position Preparatory to Vibrating Die Stone into Place.*



6. *Die Packed and Brass Dowel Pin Placed into Position.*

with petroleum jelly, the impression is boxed, and the model poured. This also produces a working model with removable dies.

3. A simple method for the beginner is to take two separate impressions at the time of the patient's first sitting. In one, die stone is vibrated into the cavity preparations, and the other is boxed and die stone vibrated into the cavity preparations. While still soft, model stone is vibrated into the remainder of the impression.

In this way separate dies are produced on which the wax patterns may be fabricated and the inlays polished. The solid model with non-removable dies is used to establish contact points on the wax pattern, to construct the pontic, and to assemble the bridge.

Method of Choice

Step One—Carefully insert a small length of stainless steel matrix into the hydrocolloid over the mesial floor of the cavity preparation. *Only the ends of the matrix metal engage in the hydrocolloid and the bottom portion of the metal is slightly short of contacting the hydrocolloid of the mesial floor. Thus, no distortion of the cavity floor is induced by the insertion of the metal strip.*

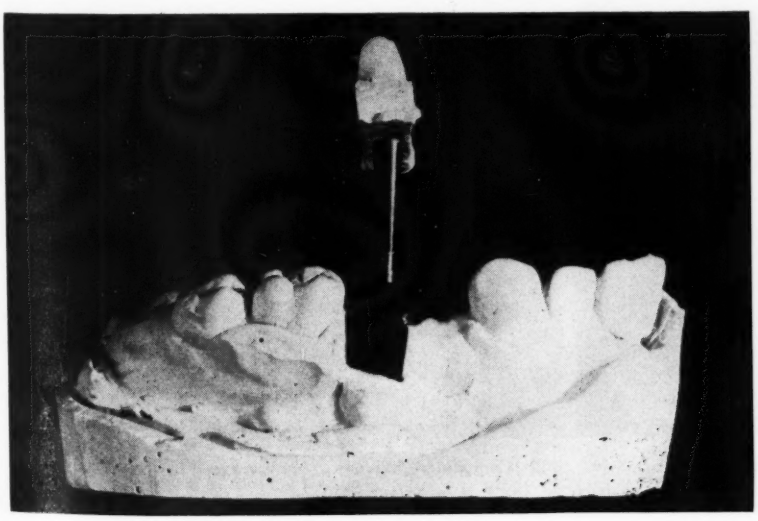
Step Two—Introduce another length of matrix metal on the distal aspect of the preparation. Place the two pieces of metal in a position similar to an inverted "V" (Fig. 5). This gives the "root" portion of the die a slight taper and facilitates its removal from the completed model.

Caution—When the teeth adjacent to the abutment preparation are bell crowned on the mesial and distal aspects the die may be found to be locked into place. To avoid this, additional matrix metal strips may be inserted into the hydrocolloid so that the adjacent teeth may also be made removable.

Step Three—The die stone should be kept just short of filling the confining matrix metal strips in order to avoid overflowing and creating another lock which would also prevent removing the die from the model. While still soft, gently push the head of a tapered brass dowel pin into the die stone (Fig. 6). Use one pin for each die or tooth to be removed from the completed model.

(Placing the dowel pins approximately parallel with the long axes of the teeth and with one another while the die stone is still soft also facilitates removal of the dies later on).

Step Four—Place the impression in a humidor or wrap in a wet towel until the die stone has set. Paint the exposed portion of the die stone and dowel pins with a very thin light coating of vaseline or mineral oil as a separating medium, box the im-



7. *Completed Working Model, Showing Die Extruded.*

8. *Completed Bridge on Working Model.*

9. *Completed Bridge in the Mouth.*

pression and cautiously vibrate model stone into the remainder of the impression. Allow approximately 1/8 inch of the ends of the dowel pins to protrude.

Step Five—After the model stone has hardened, remove the boxing wax. Soak the model briefly in warm water and lift out of the hydrocolloid. A sharp tap with a metal instrument on the exposed metal dowel pins will cause the dies and adjacent teeth to be readily extruded from the model (Fig. 7).

Step Six—Reinsert the dies into the model, place a small piece of carding wax over the exposed ends of the dowel pins and the working model is articulated. Now construct the inlays and pontics according to preference. An excellent lubricant for stone dies is a 10 per cent aerosol solution. The bits of matrix metal may be removed if desired. The base of the dies will be sufficiently irregular to provide a seat, or lock, in the model and thus prevent a mesial or distal movement of the dies.

Construction

Following are the five steps usually taken: 1. Wax and cast the inlays.

2. Wax and cast the pontics.

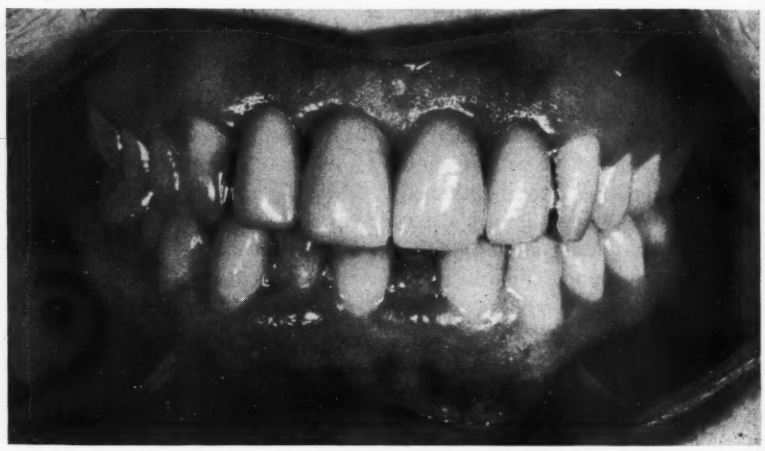
3. Wax the pontics into position with a bit of sticky wax and a paper clip strengthener.

4. Remove the assembled bridge, invest, and solder one joint.

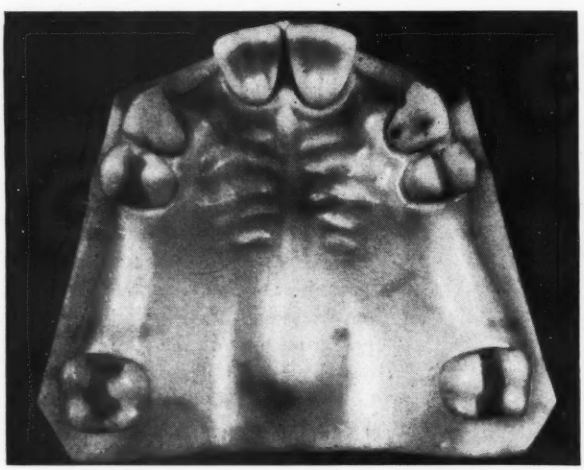
5. Remount on the cast, reassemble, reinvest, and solder the other joint. The bridge is now completed (Fig. 8).

Typodont Model

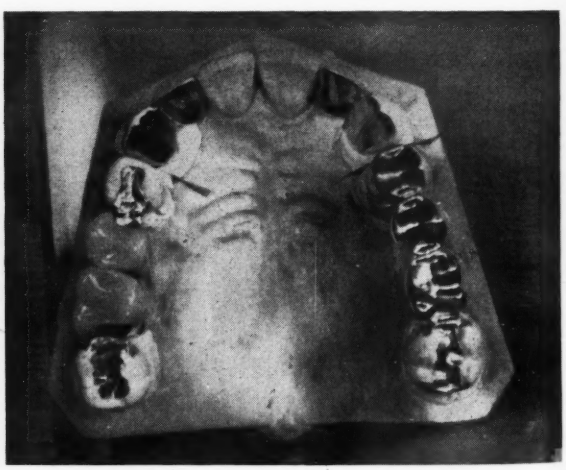
To demonstrate the versatility and accuracy of the hydrocolloid technique, preparations for four separate



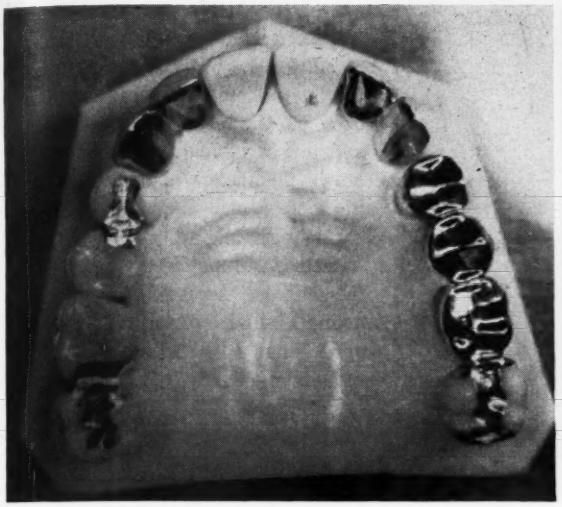
10. *Six Tooth Anterior Bridge Constructed by Hydrocolloid Technique.*



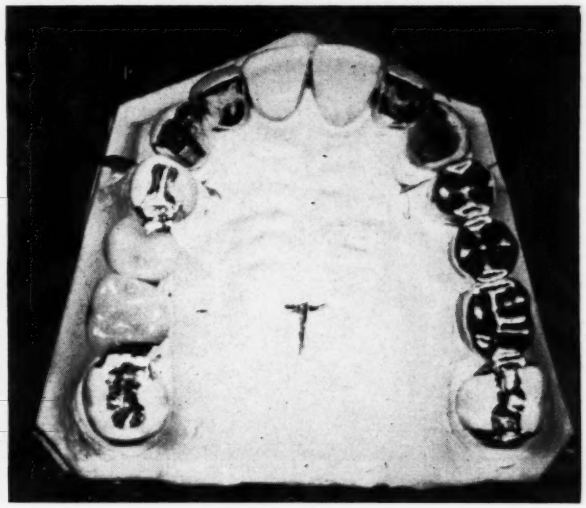
11. *Typodont Model with Cavities Prepared.*



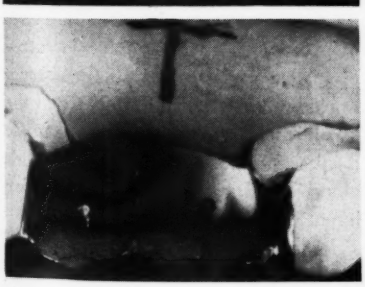
12. *Completed Bridges in Place on Working Model.*



13. ***Completed Bridges in Place on Typodont.***



14. ***Completed Bridges in Place on "Test" Model.***



15. ***Top: Close-up of Bridge on Working Model. Note Accurate Fit of Inlay Margins.***

16. ***Center: Close-up of Bridge on Typodont. Note Accurate Fit of Inlay Margins.***

17. ***Bottom: Close-up of Bridge on "Test" Model. Note Accurate Fit of Inlay Margins.***

bridges were made on a typodont model (Fig. 11).

Working Model—This model with removable dies, was constructed according to the technique outlined in this report.

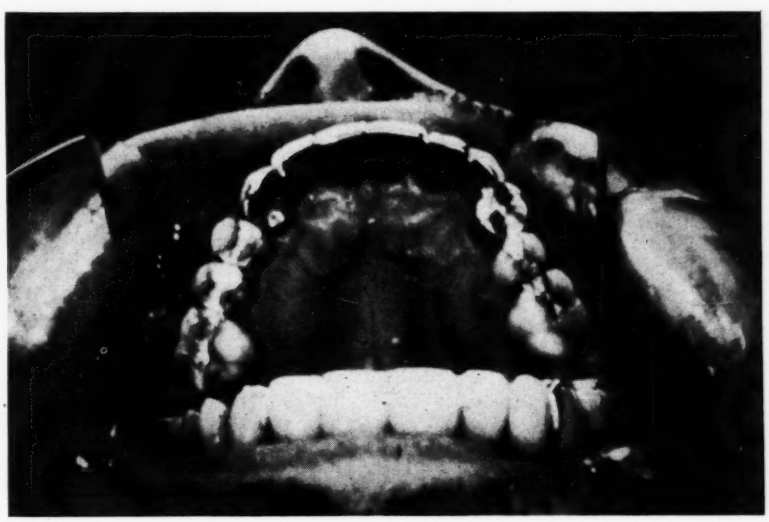
Four Bridges—On this working model (Fig. 12) four bridges were constructed. Among them was one with a pin inlay abutment and another with precision attachments. All bridges fitted readily on the master typodont model (Fig. 13).

Accuracy Test—Using the same technique, a second model was prepared from the typodont, and all bridges fitted easily to place on it (Fig. 14).

Close-ups—(Figs. 15, 16, and 17) the same inlay margins on the working model, typodont, and test model fitted with accuracy.

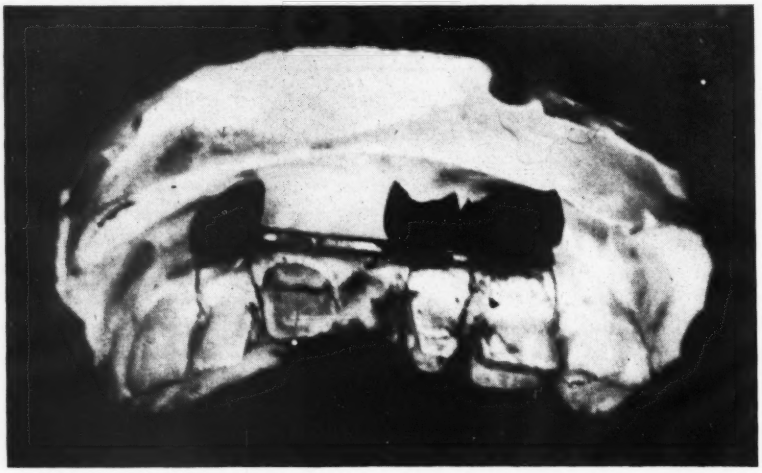
Fixed Bridge—Multiple inlay abutments on one fixed bridge (Figs. 18 and 19) are routine procedure. Three-fourth crowns are used on the upper right bicuspid, right lateral, and left cuspid as abutments for a fixed restoration supplying the left lateral, central, right central and cuspid.

Abutment Teeth—The upper left first molar, second bicuspid, and left

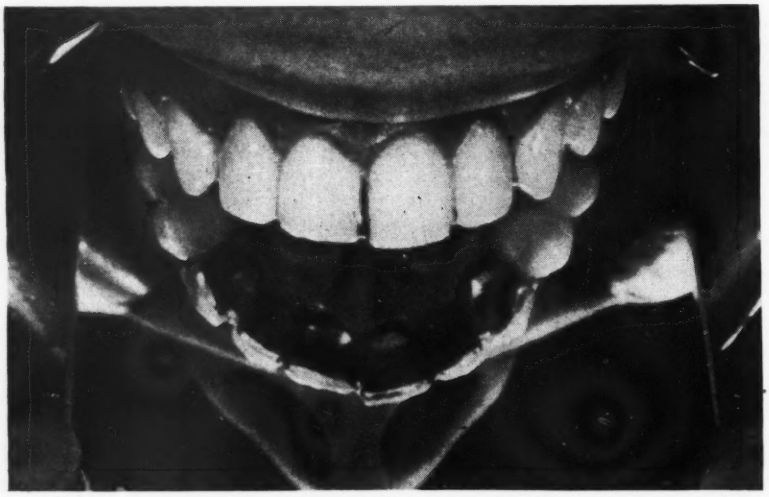


18. ***Fixed Bridge Supplying Right Cuspid, Both Centrals, and Left Lateral, Utilizing Right First Bicuspid, Right Lateral, and Left Cuspid as Abutments.***

19. ***Two Fixed Bridges Utilizing Three Abutments on Each.***



20. ***Wax Patterns Luted Together and Removed From Model to Correct any Discrepancy in Parallelism of Retention Grooves.***



21. ***Fixed Bridge Restoring Two Lateral Incisors, Utilizing Both Centrals and Cuspids as Abutments.***

lateral (Fig. 19) were the abutments for the bridge supplying the cuspid and first bicuspid. On the right side, the lateral and first molar were utilized as abutments with ¾ crowns, and the first bicuspid with a veneer crown. The cuspid and second bicuspid were replaced.

Compensating for Discrepancy—After the wax patterns are carved on the dies they are luted together with a length of wire paper clip (Fig. 20) and all are lifted together from the working model. By shaving off minute internal bits of the patterns any slight discrepancy in parallelism of the retention grooves is compensated for.

Loose Joint Bridges

Simple Laboratory Procedure—With the hydrocolloid technique, designing loose joint posterior bridges with a precision lock rest becomes a simple laboratory procedure.

Replacing a First Molar—The most posterior abutment tooth usually carries the pontic while the female section of the lock is made in the most anterior abutment tooth. The second molar is often found to have tipped mesially while the position of the second bicuspid is normal.

The Supporting Tooth—Having two roots, the molar is better able to support the load of the pontic than the bicuspid. The stresses of mastication will serve to seat the male part of the lock more firmly into place.

Fixed Restoration of Two Laterals—Both centrals and cuspids were utilized as abutments (Fig. 21) in a case of precocious advanced alveolar atrophy. The extensive alveolar destruction about a lateral (Fig. 22) and the involvement of the other lateral made it questionable whether the cuspids alone could support the bridge for long.

Removable Restoration Contraindicated—By utilizing the centrals, as well as the cuspids and making one fixed restoration, a splinting effect was obtained which should add to the success of the case.

Method of Making Jacket Crowns

Advantages—The chief advantage of hydrocolloid in jacket crown work

is that the working die is lined up with perfect accuracy in relation to the adjacent teeth. Less adjustment is required when the restoration is inserted.

Technique—1. Two hydrocolloid impressions are taken of the replacement area and preparation.

2. Stone dies and models are prepared as described previously.

3. A compound tube impression is taken of the stone die jacket crown preparation. This may be either electro-formed or an amalgam die may be prepared.

4. The platinum matrix is formed and swaged to the metal die.

5. The matrix is transferred to the stone die and model and the porcelain jacket crown is fabricated in the usual manner.

Summary

1. The use of hydrocolloid in restorative dentistry is not new.

2. The potential applications of hydrocolloid are infinite.

3. The limitations of its use are only dependent upon the skill and ingenuity of the operator.

4. Descriptions have been given of several variations of the original technique employing hydrocolloid impression material.

Conclusion

Hydrocolloid technique is essentially a precision technique. The most extreme atention must be paid to the details in each step. Carelessness in any respect will produce only failure and disappointment. It is hoped that a working knowledge of the hydrocolloid technique will be gained from this description and the reader's interest sufficiently stimulated to apply the technique to his own practice.

873 *Lakewood Blvd.*

Announcement of Books Received

OUTLINE OF BACTERIOLOGY, By Evelyn B. Tilden, Ph.D., Chicago, Northwestern University, 1948. Price $1.75.

DIAGNOSTIC ORAL ROENTGENOLOGY, By William E. Durbeck, A.B., D.D.S., Brooklyn, New York, Dental Items of Interest Publishing Company, Inc., 1948.

COMPLETE DENTAL REVIEW, By Walter Neal Gallagher, D.D.S., Brooklyn, New York, Dental Items of Interest Publishing Company, Inc., 1948. Price $9.00.

PRACTICAL DENTAL ASSISTING, By John Oppie McCall, D.D.S., Brooklyn, New York, Dental Items of Interest Publishing Company, Inc., 1948.

ORAL SURGERY, Vols. I and II, By Kurt H. Thoma, D.M.D., St. Louis, The C. V. Mosby Company, 1948. Price $20.00.

AN INTRODUCTION TO THE HISTORY OF DENTISTRY and AN INTRODUCTION TO THE HISTORY OF DENTISTRY IN AMERICA, Vols. I and II, By Bernard Wolf Weinberger, D.D.S., St. Louis, The C. V. Mosby Company, 1948. Price $20.00.

PRACTICAL ORTHODONTICS, By George M. Anderson, D.D.S., St. Louis, The C. V. Mosby Company, 1948. Price $10.00.

CONDUCTION, INFILTRATION AND GENERAL ANESTHESIA IN DENTISTRY, Revised Fifth Edition, By Fred R. Adams, D.D.S., and Hillard R. Nevin, L.D.S., D.D.S., Brooklyn, New York, Dental Items of Interest Publishing Company, Inc., 1948.

LIPPINCOTT'S HANDBOOK OF DENTAL PRACTICE, Edited by Louis I. Grossman, D.D.S., D.M.D., Philadelphia, The J. B. Lippincott Company, 1948.

Restoring PRIMARY MOLARS *with Rampant Caries*

LOUIS B. KELSTEN, D.D.S., Newark

DIGEST

A gold inlay is suggested as the answer to the challenge presented by the necessity of restoring the vital primary molar which is unfavorable for deep box preparation. A simple procedure that has proved accurate and satisfactory is herein outlined step by step.

Unfavorable Morphology

FOR SEVERAL reasons it is difficult to make durable compound restorations of cement or amalgam for vital primary molars where the proximal surfaces are badly undermined with caries. The main difficulties are:

1. *Location*—The primary molars are located in a small, saliva-drenched mouth.

2. *Shape*—They are small and bell-shaped and have a deep slope at the proximal surface.

3. *Construction*—The enamel and dentin of these teeth are thin and they have relatively large pulps with long mesial horns.

The Gold Casting

The problem of restoring the extensively carious primary molar has been solved satisfactorily with the gold casting.

Favorable Factors—1. The strength of the casting makes it possible to conserve needed tooth structure. Consequently there is less threat to the pulp and decreased pain during cavity preparation.

2. The necessity of retaining the primary dentition of the very young is supplied by the cast inlay which provides (a) better contact, (b) contour, (c) occlusion, and (d) durable margins.

3. Many of the discouraging results, drifting of teeth, defective or lost restorations, devitalizations, and abscesses encountered in children's dentistry are prevented by supplying a gold inlay.

Constructing the Inlay

The following procedure is a modification of the Willett technique:

1. Make the grooves sharper and bevel the margins to improve retention and provide a more finished cavity preparation.

2. The impression should be taken with alginate material. This aids in producing a casting which will seal the cavity more accurately.

To Obtain Separation—Where separation is required the following simple steps can be taken:

1. Brass ligature (26-gauge) should be inserted interproximally and bent over the marginal ridges.

2. Turn the ends clockwise until the patient tells you the wire feels tight.

3. Cut the ends leaving a 3-millimeter stump which is to be tucked into the gingiva where it will not irritate the cheek.

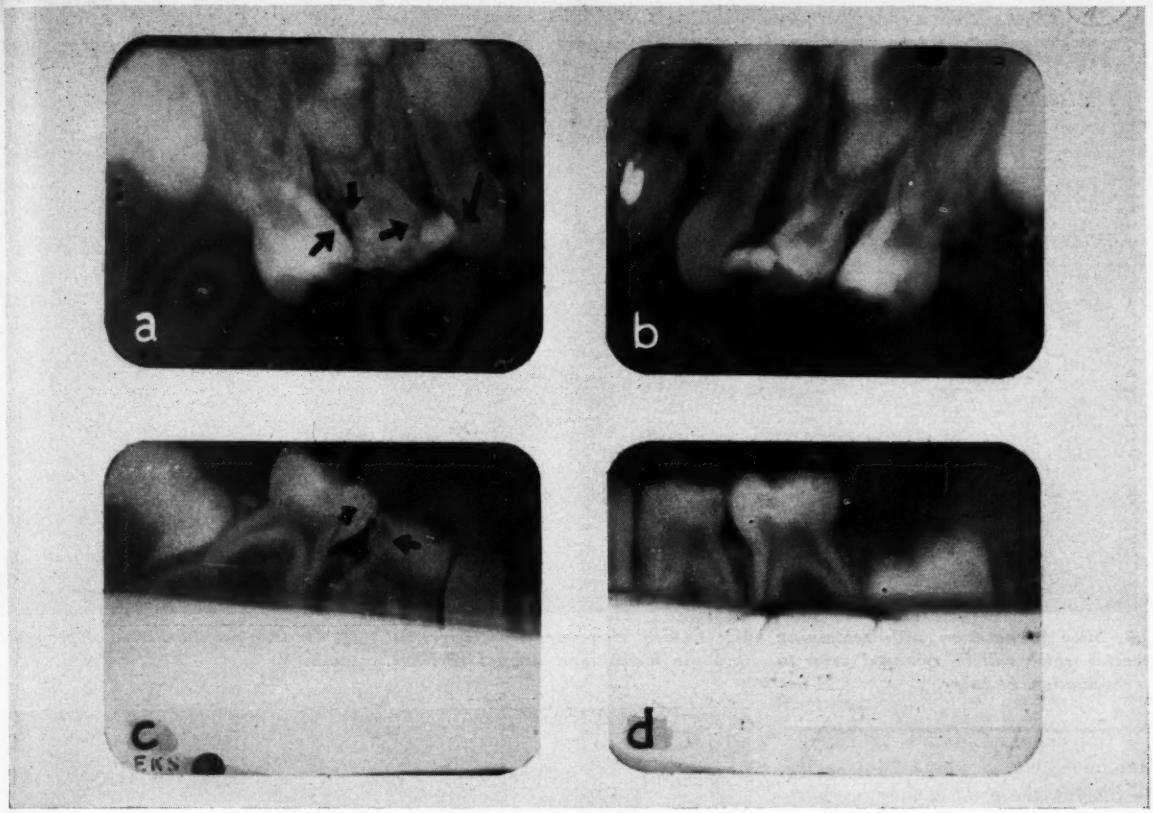
The ligature will cause separation within 24 hours.

After the Ligature is Removed—1. The carious proximal surface should be sliced with a diamond separating disc with a guard on the handpiece and the slice smoothed with a disc, ⅝ inch, medium. If proximal caries is still present, it can be removed later.

2. With a diamond knife-edged stone in the contra-angle make grooves on the occlusal, buccal, and lingual following the anatomic grooves of the

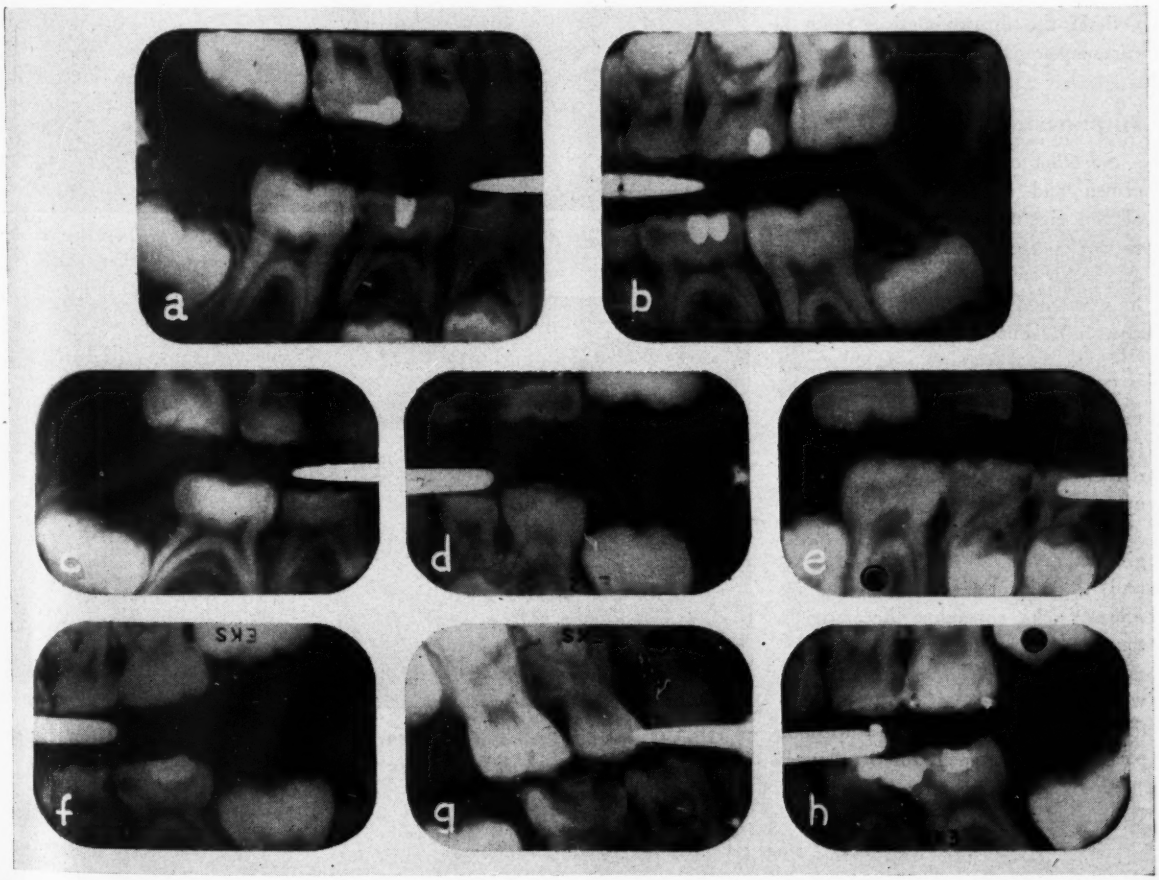
1. *A common example of proximal caries. Since these teeth must be retained for several years, cement or even amalgam is not practicable; inlay castings would serve as more durable restorations.*

2. *Proximal caries in teeth with protruding pulpal horns. Here the box-step preparation for retention and bulk for amalgam restoration may cause pulpal exposure.*



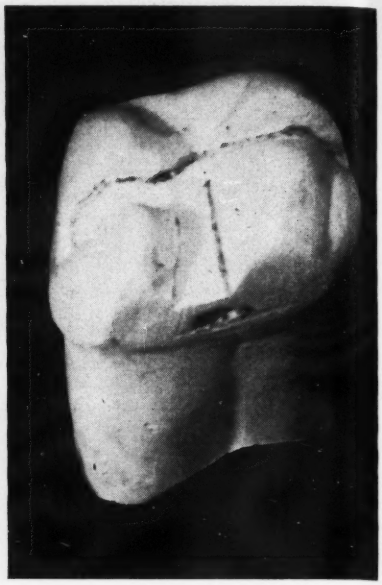
3. *Rampant caries in child of four. Films are slightly hazy because they were taken on an unruly youngster. Lower negatives were bent to conform to patient's small mouth. Gold castings in this case will prevent much of the discouraging results prevalent in children's dentistry.*

4. *Additional examples of proximal caries where cast restorations are indicated.*



5. ***Slice preparation with remaining caries which will be removed prior to cementation of inlay.***

6. ***Occlusal view retentive grooves cut into the buccal and lingual surfaces.***



7. ***Occluso-proximal view of prepared tooth.***

tooth.

3. Now the grooves may be sharpened with a #557 cross-cut fissure bur in the contra-angle.

4. The margins should be bevelled with a diamond pear-shaped stone in the contra-angle.

5. If the approximating tooth is carious, prepare it in the same way.

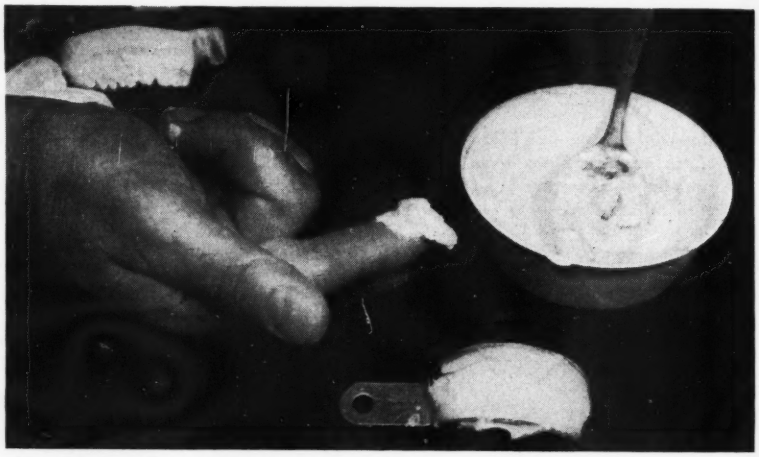
Impression

Selection of Crown—A perforated crown and bridge tray should be chosen that will cover the area. Correct proportions of alginate powder and water, warmed to 70° F. should be spatulated. The following steps can now be taken:

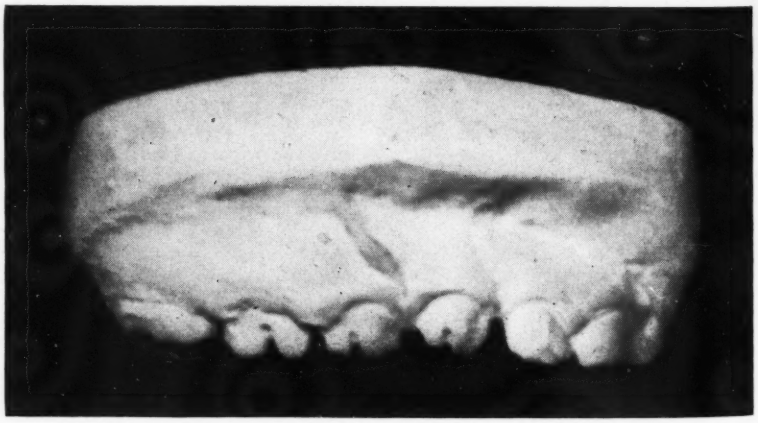
Step One—Scoop up some of the paste on a finger and push into the preparations of the teeth, previously dried by means of cotton rolls and compressed air.

Step Two—Be sure that (a) the gingival areas, (b) the proximal walls, and (c) the retentive grooves are filled. (Take care that the patient's tongue does not touch the paste).

Step Three—Now place the tray with the remainder of the paste over the teeth and keep it there without pressure or movement for 3 minutes.

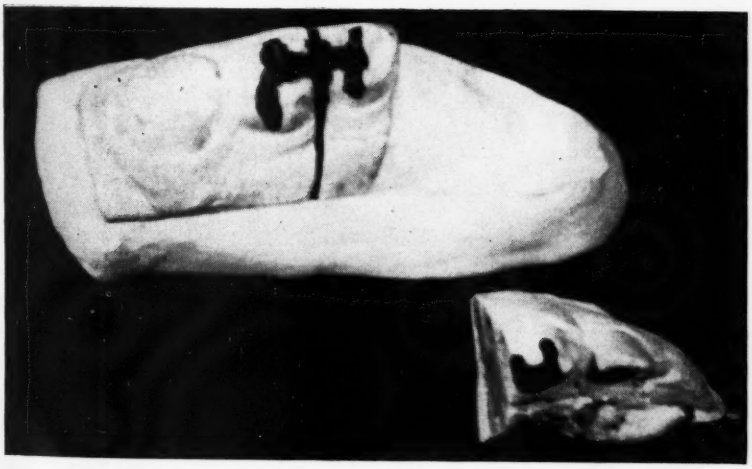


8. ***Alginate paste scooped up on a finger is pushed into the dry cavity preparations.***



9. ***Model separated from impression. Note the fine detail of the retentive grooves.***

10. ***Upper: Model has been prepared for plaster core by cutting the base into a V-shape with notches for accurate reassembling of the prepared teeth. Lower: Plaster base core.***



11. ***After the prepared teeth have been split apart and the inlays waxed up, the model is reassembled on the plaster core to test the contacts of the patterns.***

To Prevent Dimensional Change

As soon as the impression is removed, wash it with cool running water and dry carefully with compressed air. An investment model is now poured.

A Plaster Base Core—After separating the model a plaster base core is made as an index for the correct repositioning of the teeth. Now slice the base of the model with a disc so that the prepared teeth can be split apart without damage to the cavity preparations.

Reassemble the Model—The inlays are waxed up on the prepared teeth. Then reassemble the model on the plaster core to test the contacts of the patterns.

The Teeth are Invested—The teeth are cut from the model and their patterns sprued. They should now be invested for wax elimination and casting.

Final Steps—1. Little or no grinding will be required for the castings if the original anatomy of the prepared teeth has been restored carefully.

2. All polishing should be done prior to cementation.

3. Remaining caries can be removed at this time with a round bur and the preparations treated with silver nitrate and thymozin #2.

4. Now cement the inlays.

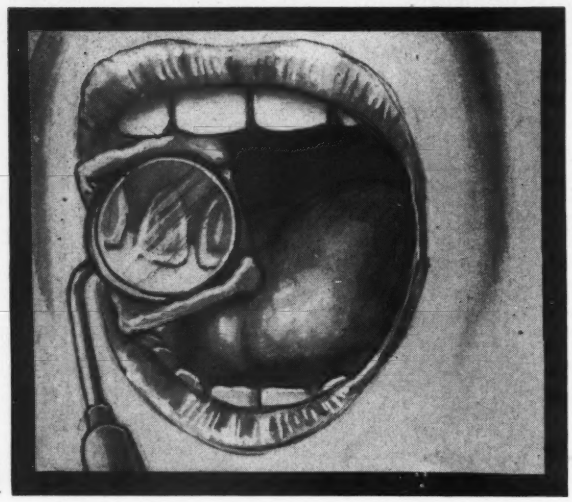
Summary

The inlay is useful to the dentist as well as the patient by reducing expense and the embarrassment of replacing defective and lost restorations when the carious primary molar is to be restored. The cost of using the inlay technique described on several approximating molars can be relatively low because operating time is shortened. The technique has been used for some time and has been found to be simple to carry out, accurate, and comfortable for the child.

427 *Lyons Avenue*

12. ***Cementation of casting after remaining proximal caries has been removed.***

Clinical and Laborator

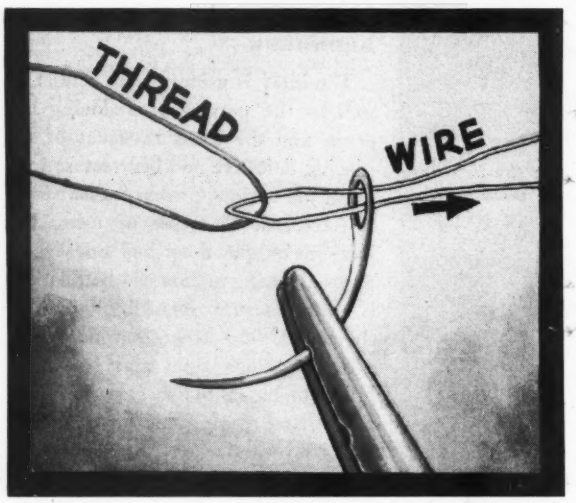


1

A Plastic Mouth Prop

Robert H. Berne, D.D.S., Cleveland

1. This is a combined mouth mirror and mouth prop. It is particularly useful for children. The construction is as follows: Adapt wax around the mirror, making grooves to hold the mirror in position. Process in acrylic. The areas that carry the occlusal stress are left rough and unfinished.

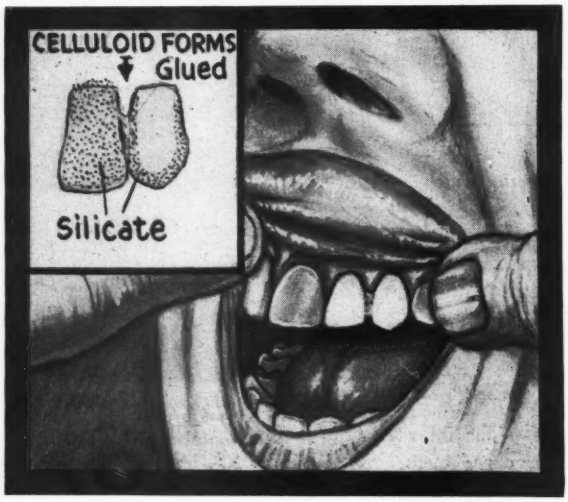


2

Threading Suture Needles

Frank Popper, L.D.S., R.C.S., M.S.D., Johannesburg, South Africa

2. Bend the thin stilet wire from any long injection needle to form a narrow hairpin and press the bent part to form a point. This point is easily pushed through the eye of the needle. Then the suture thread can be inserted and the wire removed.



3

A Temporary Anterior Bridge

Daniel D. Klein, D.D.S., Chicago

3. Select two celluloid crown forms. Fasten them together with airplane glue or cement. The form that is the pontic is filled with silicate cement. The form that covers the abutment tooth is attached to the tooth with silicate.

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For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay $10.00 on publication.

You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make

SUGGESTIONS . . .

Extraction of Pulpless Teeth

Daniel Gallo, Jr., D.D.S., Elmhurst, N. Y.

4. A copper band is adapted snugly to the tooth that is to be extracted. The band is forced as high as possible toward the apex. The band and the tooth are grasped in the forceps. This external metal reinforcement prevents tooth fractures during extraction.

4

Reinforced Joe Dandy Discs

S. Mulder, D.D.S., Utrecht, Holland

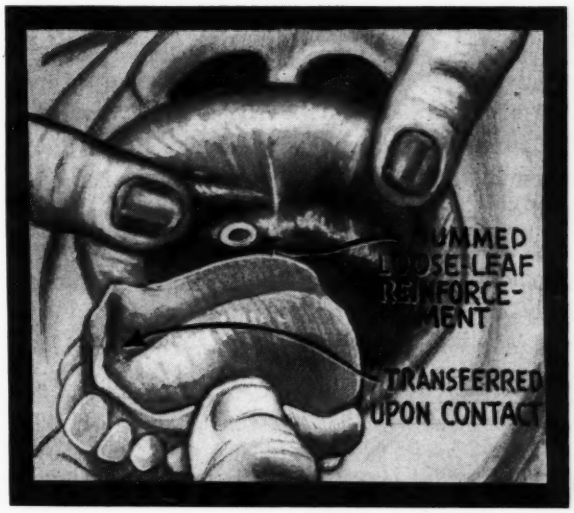
5. One disc, ⅞ inch in diameter, and a smaller one, ⅜ inch in diameter, are fixed on the same mandrel. This double disc is as strong as a carborundum stone and is useful in all types of grinding procedures.

5

Registering Denture Sore Spots

M. A. Klinger, D.D.S., Detroit

6. Place a #2 gummed loose-leaf sheet reinforcement on the sore spot on the mucous membrane with the gummed side toward the denture. When the denture is carefully returned to the mouth, the reinforcement will adhere to the denture in the exact location of the sore spot.



6

suitable illustrations; write a brief description of the technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time.

Turn to page 84 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

diagnosis is long-delayed or missed entirely.

The term "extragenital chancre" is used to describe the initial lesion of syphilis occurring on the body rather than the genitals. From observations made at the syphilis clinic of Johns Hopkins Hospital and private office records it was noted that extragenital chancres heal as readily under either metal chemotherapy or penicillin treatment as those occurring on the genitals.

It is interesting to note that the majority of extragenital chancres (73.1 per cent) was found in clinic patients. In the clinic patients, 71 per cent of all extragenital chancres occurred between the ages of 21 and 40 years. This distribution paralleled closely that for patients with genital lesions of early syphilis during the same period. 59 per cent of all genital lesions were found in the 21 to 40-year span. This is the period of great overt sexual activity.

Among private patients the age of distribution of patients with extragenital chancres showed a shift toward the older groups; many occurred in professional people. Only 54 per cent fell within the third and fourth decades.

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Except for chancres on the tongue and fingers the lesions are relatively painless and indolent. Patients usually wait a long time before consulting a physician. Acute systemic manifestations are usually not incapacitating and are of relatively short duration.

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The cardinal clinical findings should immediately arouse suspicion. These are induration, indolence, and unilateral, and usually solitary, adenopathy. It is important to keep these in mind so that the disease may be detected in the patient and to protect the professional man in dealing with these patients.

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The tendency toward emotional illness is quantitative. Where the tendency is slight the stress must be great. Where the tendency is strong, the stress may be weak. All people are constantly adjusting to conflicts; seldom is there a single cause in an emotional illness.

In making an effort to understand any maladjustment it is necessary to keep four factors in mind. These are: (1) the previous experience of the individual, (2) his own personality structure· (3) his personality needs, and (4) the environmental demands.

With the complex and changing adjustment that is necessary for present day living it is not unusual for inner conflicts to generate a feeling of tension which we sense consciously as anxiety. Some clinicians maintain that anxiety is the universal disease of our time and that psychosomatic disease is the visceral expression of our anxiety.

This view that anxiety is the predominant reaction in a functional illness is a valuable and unifying concept. In the various psychosomatic disorders, the symptom is due to a chronic and exaggerated state of the normal physiology of the emotion, with the feeling part repressed. Chronic anxiety may produce long-continued visceral dysfunction which may in turn result in structural changes of an organ.

There are certain types of illnesses in which emotional factors play an important role. Also it is true that anxiety may affect any somatic function. Gastrointestinal reactions are frequently noted such as peptic ulcer, chronic gastritis, mucous colitis, hyperacidity, and pyloric spasm. Paroxysmal tachycardia, pseudoangina pectoris, some types of hypertension, and neurocirculatory asthenia are types of cardiovascular reactions. The genitourinary system may be affected with resultant dysuria, impotence, frigidity, and some menstrual disturbances. Frequently persons have a definite skin reaction which may include allergic responses, factitia dermatitis, and eczema. Asthma and nasal mucosal congestion are examples of respiratory reactions.

Man is essentially an organism delicately balanced between external and internal forces which determine his activities. When this balance is disturbed, disordered personality functioning and disordered body

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Malignancies of the mouth should not develop beyond the earliest stages. The accessibility of the oral cavity for examination eliminates any reason for an oral lesion going unnoticed. When dentists and physicians give as careful attention to suspicious oral lesions as they do to similar lesions elsewhere in the body, the mortality from this type of cancer should be markedly reduced.

Cancer of the mouth is one of the most easily discoverable forms of cancer. Many of the causes contributing to it are well known and the tissues are accessible for observation and treatment. The problem develops into one of looking for oral abnormalities.

The era of intense specialization has brought about a different approach in the examination of patients. Formerly the physician examined the tongue and mucosa of the oral cavity. He recognized instinctively that the mouth was a barometer of health or sickness.

Today, it is the dentist's duty more than ever before, to examine the cheeks, tongue, and gingival tissues for suspicious sores, swellings, or other evidence of pathology.

The most important oral pathologic manifestations are: leukoplakia, Vincent's infection, warts, papillomas; tubercular, syphilitic, and cancerous ulcers; submucous nodules, cysts and adenomas; stomatitis, glossitis, fissural tongue, and bulging teeth. Pyorrhea and the streptococcus infections with their inflamed mucosa are also common lesions of the mouth.

The danger from irritations caused by ill-fitting dentures should be stressed to the users of these appliances and these persons should be impressed with the necessity of adjustment or replacement when their continued use cause discomfort. Irritations to the cheeks or tongue caused by carious or broken teeth should be eliminated by repair or extraction of the offending tooth or teeth.

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Necropsy records are of considerable epidemiologic value. They are limited in number yet they are found to be the most accurate data available relative to anatomically significant tuberculous disease. It is not sufficiently appreciated that many pathologic changes, including formation of cavities, often are recorded in the anatomic diagnosis without tuberculosis appearing as the main, or even as a contributing cause of death.

In a series of 1,332 postmortem examinations by the Medical Examiner's Staff of the Borough of Manhattan, 4.58 per cent of the persons examined had tuberculous cavities in the lungs. Cavity formation was found more often in white persons than in Negroes, the ratio being 1.4 to 1. Three-fourths of the subjects with cavities were white persons over 40 years of age.

Among white persons, males exhibited cavity formation 7.7 times more often than females. Nine of every ten white males with cavity formation were over 40 years of age. It is interesting to note that in a group of 61 subjects exhibiting tuberculous cavity formation and endobronchial spread, in only 13 instances was death registered as due to tuberculosis.

Thus it appears that in the absence of evidence obtained by necropsy or biopsy, vital statistics are of limited value. This is important in the public health aspect of the problems as many more people are spreading tuberculosis than are actually detected by x-rays, tuberculin tests, etc.

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The reasons for the preponderance of white men over 40 years of age with tuberculous cavities are not apparent, but it is evident which group of the adult population contains the greatest number of unknown spreaders of infection. As far as employment and residence are concerned it is obvious from the records that the spread of the bacilli is general rather than local. This presents one of the most difficult problems in the epidemiologic control of tuberculosis.

When clinical tuberculosis is discovered in an adult, the community as a whole should become the center of investigation for unrecognized "spreaders" of the infection. In such an investigation, taverns, the eating houses, crowded places of amusement, and public conveyances are of equal importance with the place of work.

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diagnosis is long-delayed or missed entirely.

The term "extragenital chancre" is used to describe the initial lesion of syphilis occurring on the body rather than the genitals. From observations made at the syphilis clinic of Johns Hopkins Hospital and private office records it was noted that extragenital chancres heal as readily under either metal chemotherapy or penicillin treatment as those occurring on the genitals.

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Diabetes vs Coronary Artery Disease

Although advanced coronary artery disease is generally accepted as a frequent complication of diabetes, the high incidence of this complication has not been fully appreciated. This is probably due to the fact that the overall statistics for diabetes usually include young diabetic patients in whom severe coronary artery disease is infrequent. Of approximately 1,000,000 persons with diabetes in the United States, 25 per cent are estimated to be less than 44 years of age

The average age at death of person with diabetes has risen from 44.5 years in 1894 to 65.5 years in 1945. In elderly persons, coronary disease is more frequent and of greater severity whether diabetes is present or not.

By means of postmortem injection and careful observation, functionally significant coronary artery disease was disclosed in nearly 75 per cent of the hearts of a large group of diabetic patients in a comprehensive series of studies. One third of these patients had died of coronary heart disease. One quarter of the entire group had had angina pectoris.

Among diabetic women over the age of 40 the incidence of significant coronary artery disease resulting in death is as great as among diabetic men. The same is true of significant coronary arteriosclerosis and of angina pectoris. This is in sharp distinction to the sex difference in these respects in the non-diabetic population.

Angina pectoris, deaths due to acute coronary disease and congestive heart failure are more common when hypertension is present in diabetic patients than when the blood pressure is normal.

In middle-aged persons with diabetes the clinical diagnosis of functionally significant coronary artery disease can be made more frequently by maintaining a high index of suspicion, obtaining a careful history, and performing proper clinical and laboratory tests. Any diabetic man or woman over the age of 40 can be assumed to have advanced coronary artery disease even in the absence of symptoms, particularly if hypertension is present, and more particularly if the diabetes is of more than 10 years' duration. (The severity of coronary arteriosclerosis is correlated with the *duration* but not with the severity of the diabetes).

Pain in the chest in a middle-aged diabetic person should be considered as angina pectoris due to coronary heart disease unless some other disease can be shown to be the definite and sole cause of the symptom.

The proper use of insulin is important in this respect. By causing stimulation of the sympathetic nervous system and the discharge of epinephrine, insulin hypoglycemia greatly increases cardiac work and may precipitate angina pectoris and even myocardial infarction. "Knife edge" control of the blood sugar level in diabetic pa-

tients is therefore undesirable in the presence of coronary artery disease, since neither the activity nor the diet of most patients can be controlled continuously and with exactitude.

Rather than risk hypoglycemia, therefore, it seems wiser to regulate the middle-aged or elderly diabetic patient so as to maintain the fasting blood sugar level at not less than 120 mg. per hundred cubic centimeters. In the absence of diabetic symptoms, ketonuria, and loss of weight, such a constant mild hyperglycemia is preferable to a more rigid type of control which sooner or later will be complicated by insulin hypoglycemia.

Stearns, Samuel; Schlesinger, Monroe J.; and Rudy, Abraham: Incidence and Clinical Significance of Coronary Artery Disease in Diabetes Mellitus, Arch. Int. Med. 80:463-474 *(October)* 1947.

CLINICAL AND LABORATORY SUGGESTIONS

(*See pages 76 and 77*)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor
DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

_____

Subject: _____

Explanation of Procedure:

Sketch:

$10 will be paid to author on publication of accepted suggestions.

Contra-Angles

A Primer on Government Dentistry

THERE IS little doubt that some kind of federalized health program will be introduced in the 81st Congress. Whatever kind of program, there will be dental benefits included. How many, and what kind of benefits is anybody's guess. If the fees sound satisfactory and the pressure is strong enough, the self-interest of dentists will prompt them to accept the program. We can scream to the top of our voices regarding the grave dangers in a government treatment program; we will hear the angry threats of non-cooperation, but if the picture is painted bright enough, and the income possibilities are attractive dentists will flock to the program even if it is *state dentistry*.

What is state dentistry? What is socialized dentistry? What is compulsory health insurance? We may as well get ourselves straight on the subject rather than wallow in the swamp of semantic misunderstanding. State dentistry is a system wherein the government pays dentists, either on a fee basis, a capitation basis, or by salary. The money comes from general tax funds and everybody is eligible for the benefits although the services may be restricted. That is, the funds available may not pay for complete dental care. Socialized dentistry (the Russian model) usually defines a system of salaried dentists with no opportunity offered them to work as private entrepreneurs.

Great Britain had a part system of national health care for more than 35 years. This was a system that operated on a contributory basis paid in part by employee, employer, and the government. Not everybody was included. The dental benefits were extra rather than statutory. They were

incomplete. Dentists worked on a fee basis. This was called the panel system.

When the new health scheme began in July 5, 1948 everybody was included for dental benefits. Small personal contributions were made to the general fund. Most of the money came from general tax sources! Dentists worked on a fee-for-service basis. Physicians, however, worked on a capitation basis, being paid so much per head per year for everybody registered on their lists. The Minister of Health estimated that dental benefits would amount to 28 million dollars for the first nine months of the program. Actually, the cost was in excess of 80 million dollars. Almost everybody flocked to dental offices for free care. The average "take" per dentist was close to $10,000 with some of them luxuriating in the $40,000 class. This was a golden harvest but it appears that it will be a short-lived one.

With dentists making this kind of big money, by far more than most of them had made before, the wail about state dentistry becomes faint and far away. Dentists like their new prosperity. The Minister of Health, however, is not so happy. He is going to review the situation and reliable observers believe that he is going to scale fees downward or put dentists on a salary basis—true Russian model socialized dentistry.

Under a system of compulsory health insurance people who are eligible to receive benefits are required to make contributions to a fund from which services are paid. The employee has a compulsory deduction from his pay check. The employer makes a contribution from his funds. The money thus collected is administered by the government. Compulsory health insurance, or sickness insurance if you prefer, is a part of the Social Security triad that includes old age and unemployment benefits. Under this kind of system the administrator of the funds makes an agreement with professional organizations with respect to types of services, fees, and working conditions. This is the kind of federalized system that is being advocated for the United States.

So much for the primer information! Now for a few interpretations and dour predictions.

Will dentists and physicians in the United States accept a compulsory health insurance system? According to the official positions of the American Dental Association and the American Medical Association, the answer would appear to be a decisive *no*. Both organizations have gone on record as opposing compulsory health insurance and the American Medical Association has recently passed a resolution to collect $3,500,000 to use in an active campaign to fight the legislation. This money will be collected by voluntary contributions of $25.00 each from all members of the American Medical Association. We will get an inkling of the actual sentiments of physicians when we see how quickly and enthusiastically the physician sends his money to the Ameri-

can Medical Association for the intended purpose. My own guess would be, having observed the voluntary responsiveness of professional men to other requests, that the money will be slow in coming. There is a human tendency to let the other fellow do the paying. But in this situation there is a large non-vocal element within the profession who do *not* want to oppose a system that might put more money in their pockets.

Concerning this group within our own ranks, I should like to enter the precarious field of prophecy; prophecy, however that is based on some historical evidence. There are some dentists who will put aside any philosophical arguments that they have against government dentistry if they can be shown that such a system will put money in their pockets here and now. I suspect this number is large, very large. They will dispose of the objections against the system if they can be shown that they will profit from the system. The future of professional advancement, the quality of service to the public, and all other idealistic arguments will be pushed aside if more money income is assured them than they now receive.

In terms of historical evidence I should like to submit the experience of the dental program of the Veterans Administration. When the program was first proposed there was a mighty commotion that centered round the subject of fees. When fee schedules were arranged, and most of them were satisfactory ones, the commotion and shouting died. When the government checks began to come to dentists, the shouting became a whisper. In one year more than 50 million dollars that they would not otherwise have received, came into the pockets of dentists. To be sure, there were howls raised against the red tape, the cumbersome records, the arbitrary methods of certifying for treatment, but most of the complaints came because the checks were slow in arriving. Only a few dentists complained that the Veterans Administration dental program was state or socialized medicine—which it was, and is.

For the year ending June 30, 1948 the Veterans Administration paid private dental practitioners $44,691,814 for treatment of 602,617 service-connected dental conditions and $5,539,360 for 420,440 dental examinations —a total of $50,231,174.

If 50 million dollars are spent in one year for dental care for a small segment of the population—the veterans, and that for service-connected disabilities only, then we may have a glimpse of the magnitude of a dental program that would include complete dental care for the entire population. It could easily be a *billion* dollars a year. This is a tempting bait. A great many dentists who have begun to feel a slight pinch of recession, who are not too sure of the economic future, who are weary of the strains of private enterprise, will be tempted by the lush bait of government funds.

To continue the dour and forboding prophecy: I can see where dentists will grasp so avariciously for the billion dollars that they will jeopardize their future exactly as they have done in Great Britain. When private or

personal practice is completely destroyed, when virtually the entire population is eligible for free dental care, there will be no returning. At first many dentists will profit more under a federalized health system, but within a short time they will be ground under the heel of red tape and bureaucracy. The surge of incoming fees for services will be blocked; they will be reduced. No remedy will be available because the bargaining power of dentists will be gone. You can't strike against the government! In a short time the fee system will be eliminated and dentists will work on salary, probably in clinics, under the system of political bosses and political patronage. That is the dental program in Russia. It looks to be what is coming to Great Britain. It could be the method in the United States.—E.J.R.

Suppurative Cervical Cellulitis of Dental Origin

Lieutenant Colonel Onas L. Johns (DC) and Captain Malcolm T. Wasley (MC)

INFECTIONS of the neck and the floor of the mouth usually have their primary focus in the oral cavity, pharynx, or nose. The most common cause is an acutely infected tooth. As a rule, the organisms are transmitted through the lymphatic channels.

In the following case the infection was characterized by extensive and severe cellulitis with abscess formation of the subcutaneous tissue of the neck, shoulder, and chest.

Case Report

When admitted, the patient, a white soldier, aged 19, presented a painful swelling in the area of the body and angle of the right mandible and in the region of the right parotid gland.

His general condition seemed poor but he did not appear to be critically ill; a diagnosis of mumps was made. The symptoms increased in severity and within three days there was extensive spreading of the edema into the neck and upper chest. The temperature rose to 104.2° and the pulse to 122. Chemotherapy, consisting of 40,000 units of penicillin every 3 hours and 1 gram of sulfadiazine every 3 hours was instituted. Moist heat was applied locally.

Cellulitis

On the fourth day the patient was acutely ill with cellulitis in the neck and chest. A fluctuating mass extended from the inferior border of the mandible along the anterior border of the sternocleidomastoid muscle to the clavicle. The chest was normal to percussion and auscultation. A loss of elasticity of the skin was probably caused by general debility and emaciation; the weight loss was 30 pounds.

Results of Examination

X-ray of the neck showed a left lateral deviation of the trachea. Slight dysphagia was present. The leucocyte count was now 24,000 with 88 per cent neutrophils, 10 per cent lymphocytes and 2 per cent monocytes. Hemoglobin was 7.5 gm. and the

sedimentation rate was 30 mm. The blood culture was negative.

Oral and dental examination revealed: (1) dental caries in 21 teeth; (2) a low grade stomatitis and gingivitis; (3) slight ulceration of the lateral border of the tongue. The floor of the mouth was soft to palpation and there was no tonsillar or pharangeal involvement. Normal secretion could be expressed from Stensen's duct and the gland was not tender.

Chronic Abscess—Besides extensive caries, x-ray examination revealed a chronic dentoalveolar abscess of the mandible at the apexes of the lower right first molar. The patient stated that he had had difficulty in masticating for several months. More recently it had been virtually impossible for him to eat because of a painful condition in the teeth and lower jaw. He had frequently applied hot wet packs to the jaw for relief.

Involuntary starvation accounted for the weight loss. In the presence of extreme anemia, however, a thorough search for other conditions was carried on for a period of about two months. Penicillin was increased to 100,000 units every 3 hours. Glucose, enzymatic hydrolysate of casein; pork pancreas[1], vitamins, and sulfadiazine were given intravenously.

Surgery

On the fifth day, under intravenous sodium pentothal anesthesia, an incision extending only into the subcutaneous tissue was made over the anterior border of the sternocleidomastoid muscle above the clavical.

Another incision was made just below the angle of the mandible. Drainage was established by means of a rubber dam. Because of severe anemia, and extensive infection, a transfusion of 500 cc. of whole blood was given, followed by large quantities of fluids by mouth. Cultures and smears of the evacuated pus showed occasional streptococci and numerous diplococci.

General Improvement—For about a month following the first operation drainage was profuse; moist heat was applied intermittently during that period. Intensive chemotherapy with penicillin and sulfadiazine was continued. Other systemic treatment included ferrous sulfate, vitamin therapy, and various supportive measures. The patient improved generally but the cellulitis continued to spread. Temporary cement fillings were inserted and forced feeding was started.

Second Operation—A large abscess formed in the subcutaneous tissue over the sternum at the level of the 5th rib. Under intravenous anesthesia, this area was incised and a large amount of thick yellow pus evacuated. Then the infected tooth was removed.

[1]Medical Supply Catalog Item No. 1-604-552.

Recovery

For several weeks profuse drainage continued. As this subsided the induration at the angle of the mandible and in the neck decreased and the tissues slowly returned to normal. Within two weeks the patient gained 25 pounds and the neck and chest healed with several areas of induration. The hemoglobin had almost doubled. Complete dental rehabilitation was started and antibiotic therapy was discontinued.

Approximately two months after

entrance the patient was discharged. He had gained 30 pounds and was in excellent condition.

Discussion

It was agreed that the cellulitis was the result of the infected tooth. Of particular interest were the facts that the infected tooth was not mobile or tender at the time the serious neck infection developed and that perceptible edema of the soft tissue was absent. The history of several weeks of pain in the tooth coupled with inability to masticate for a time previous to the onset of the cellulitis definitely pointed to the dental focus.

It was assumed that the invading organisms were transmitted from the periapical dental infection through the lymphatics to the cervical or submaxillary lymph nodes. In the presence of general debility and severe anemia a secondary infection developed which produced the cellulitis.

Contributing Factors

1. General poor physical condition with secondary anemia.
2. The formation of pockets which were resistant to treatment by the spread of the infectious process through subcutaneous tissue.
3. Unsatisfactory immunologic response did not occur which is of primary importance in the successful treatment of any infection, regardless of the type and quantity of drugs used.[2]

From Bull. U.S. Army M. Dept. 8:716-720*(September)* 1948.

Pulp Insulation and Capping

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THE TERM pulp insulation and capping is a hindrance to progress in view of our present knowledge. To protect the pulp it is imperative to reduce bacterial invasion and chemical irritation. Pulp prophylaxis is there-

[2]Seevers, M. H.: Recent Advances in Bacterial Chemotherapy; Antibiotics, Am. J. Orthodontics, 33-193-200 (March) 1947.

fore a more comprehensive and appropriate term. Pulp capping is misleading because placing a cap over an exposure may interfere with expansion and prevent easy medicinal access. A more descriptive term would be pulp convalescence, conveying the idea of attenuating the disease.

Diagnosis

The vitality and the degree of degeneration of the pulp should always be determined. Inflammation is a protective response. When insulted, the pulp attempts to recover by producing the responsive symptoms of redness, swelling, and pain.

Stages of Inflammation of the Pulp—(1) Active hyperemia, arterial congestion of the pulp, painful to sudden onset of cold.

(2) Passive hyperemia, a venous congestion, painful to cold.

(3) Inflammation, indicated by stasis edema and diapedisis. Sensitive to both heat and cold and the pulp bleeds on slight provocation when exposed.

(4) Suppuration, a breaking down of tissue with multiple abscesses and accumulation of gases. Suppuration is not amenable to treatment; the defensive mechanisms of the pulp are disorganized.

(5) Necrosis is the complete destruction of the pulp. It is not painful to heat or cold or responsive to any of the vitality tests.

Medicaments

The drug of choice in this experiment was thymol. Thymol has an effective bacteriostatic and bactericidal action. It has a high phenol coefficience, low surface tension, is slightly soluble, non caustic, colorless, and non-staining. It has also a prolonged and penetrating medicinal action and seems to slow the setting of the cement. Following is a prescription for medicated cement, liquid and powder, formulated for use in the pulp:

Rx Thymol	3.0	Rx Barium Sulphate	5.0
Chlorabutanol	1.0	Asbestos pulv.	5.0
O.1 Cloves q. s. ad.	8.0	Zinc Oxide q. s. ad.	60.0
Sig: T.Z.C. Liquid		Sig: T.Z.C. Powder	

Mixing of Thymol Zinc Cement—The stiffer the mix the more effective the medicinal action. The slower it sets, the weaker the cement, and the more difficult to apply and retain in position.

Soft Mix—Use a ground glass slab and a stiff metal spatula. Place a few drops of liquid on the slab and incorporate sufficient powder to make a soft putty-like consistency.

Stiff Mix—Add sufficient powder to the soft mix to produce a dry, granular, unyielding mass. By placing in cloth and squeezing with pliers the stiff mix may be toughened further.

Uses of Thymol Zinc Cement—The soft mix is recommended for the following purposes: (1) Where medicinal action is desired in the convalescence of an inflamed pulp. (2) For cementation of large retentive restorations, crowns, inlays, and bridges when the pulps of the prepared teeth

need protection and sedation. (3) When dryness of the prepared tooth is questionable with the probability of decay or loss of retention. (4) A soft mix permits removal of the restoration for adjustment or further treatment.

The stiff mix is useful for pulp prophylaxis. It is easy to apply and acts as a pulp sedative. It prevents hyperemia and inflammation in a large measure by its bacteriostatic action.

Conservative Treatment of the Exposed and Inflamed Pulp

1. Determine the vitality, the degree of inflammation, and the extent of degeneration.

2. Remove all decay thoroughly from all cavities on the same tooth even if it is necessary to enlarge or make an exposure. Surgical trauma of the pulp should be cautiously avoided; an anesthetic may be necessary during excavation.

3. Irrigate exposed pulp frequently during excavation with warm water to prevent drying.

4. Control bleeding with epinephrin hydrochloride 1-1000.

5. A complete circumference of axial walls may be accomplished by fitting a copper band to the tooth. Mesial and distal axial walls may be compensated for by wedging a small square of base plate gutta percha between the edges of the cavity and the adjacent tooth. Occlusally, the medicament may be protected by a thin layer of hard, fast-setting cement.

6. Dry cavity and sponge with 50 per cent thymol-alcohol mixture. Dry cavity again and sponge with a pellet soaked in medicated cement liquid. Fill to within a millimeter of the occlusal surface to allow for the placing of a hard cement filling for occlusal protection.

7. After a comfortable period of probation, a permanent restoration may be inserted in the cavity. Most of the medicament should be left in for continued insulation and sedation.

An inflamed pulp has little tolerance to variations in temperature. The patient should be cautioned to avoid for a few days chewing on that part of the mouth, outdoor exercise, and sleeping in a cold room.

Conclusions

1. The dental pulp is in most instances a vascular organ with high resistance to bacterial invasion. Treatment is largely a problem in bacteriology and pharmacology.

2. Choice of drugs in the past has done much to discredit high resistance of the pulp.

3. Extraction of teeth is often unnecessary.

4. Thymol is for the present the drug of choice. Recurrence of caries has never been observed under thymol cement. One thousand pulps have been treated in the last 12 years in this way with about 95 per cent success.

5. A cap over a pulp exposure is a hindrance to rational therapy. It merely eliminates external pressure.

From New York State Den. J. 441-447*(October)* 1948.

Continuation Courses in Periodontia

RECOGNIZING that present concepts of the interrelationship of body organs and tissues show a considerable advance from the available knowledge of a decade ago, the Faculty of Dentistry, University of Toronto, has scheduled a course in periodontology to be given from May 2 to May 6, inclusive.

Among topics to be included will be a general consideration of the nature of periodontal disease, examination and case management, pocket therapy, oxygen therapy, metabolic influences on the peridontium, significance of occlusal equilibration, gingival recession, pocket surgery, and application of principles of periodontal practice on operative and prosthetic procedure.

The course will be under the general direction of Doctor H. K. Box and Doctor C. H. M. Williams. The fee is $75.00.

Those interested should address inquiries to: The Dean, Faculty of Dentistry, University of Toronto, 230 College Street, Toronto 2B, Ontario.

To

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DENTAL DIGEST

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